



CONFERENCIA

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“Generic Properties of Single-Leader-Multi-Follower Models”
(joint work with D. Aussel, S. Dempe, and S. Lepaul)

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Abstract:

Single-Leader-Multi-Follower (SLMF) problems model situations in which a leader chooses an optimal decision while anticipating the responses of a finite set of followers who interact through a Nash equilibrium. Because of their wide range of applications, SLMF models have received significant attention over the past decade. However, their numerical solution remains challenging; in particular, even identifying feasible points can be computationally complex. For this reason, related reformulations- such as those based on the value function or on Karush-Kuhn-Tucker (KKT) conditions-are often studied.

In this contribution, we adopt the latter approach: the lower-level problems are replaced by their KKT conditions, yielding a specific class of mathematical programs with complementarity constraints (MPCCs). We introduce a notion of nondegenerate solution for this class and show that, generically, standard MPCC constraint qualifications hold and all solutions are regular. More precisely, for any given problem, we prove that – up to a set of zero Lebesgue measure – these properties persist under perturbations of the involved functions of at most quadratic order.

Keywords: genericity, MPCC, regularity, single-leader-multi-follower problems, stationary point.

